

complete and rigorous as the 'Celestial Mechanics' of La Place, and this will necessarily be a treatise on the application to the atmosphere of the general laws of force, or what is technically known as the dynamics and thermo-dynamics of gases and vapors. Such a work cannot be written now, nor when written can it be studied successfully unless accompanied by an introductory 'Laboratory manual of physics and hydro-dynamics.'

But the preparation of this latter work demands appropriate laboratory arrangements. I will, therefore, invert the order and say that further progress in meteorology demands a laboratory and the consecration of the physicist and the mathematician to this science. Something like this was started in 1881, by General Hazen, in establishing a 'Study Room,' but it was ruled out by the report of a committee of Congress, and since that day meteorology has more than ever looked to the universities for its higher development. The applications of climatology to geology, physiography, hygiene, irrigation and other matters have been developed, but meteorology itself, the most important and the most complex of all the physical sciences, still remains to be provided for.

The crying need of this science is a *home*, a domicile, a meteorological laboratory, and full recognition as a course in university study.

Without experimentation there is no true progress in the physical sciences.

CLEVELAND ABBE.

WASHINGTON.

CORRESPONDENCE.

A CARD CATALOGUE OF SCIENTIFIC LITERATURE.

EDITOR OF SCIENCE, *Dear Sir*: The efforts which students of the Natural Sciences are constantly making to provide themselves with more complete summaries of the

literature of their various departments all testify to the existence of a wide-spread feeling of dissatisfaction with the existing methods of cataloguing scientific papers and reporting upon the results of scientific research. That this dissatisfaction is felt by none more keenly than by those engaged in the work is shown by the appeal made last spring by the Royal Society to various universities and learned societies for advice as to the feasibility of maintaining by international coöperation a complete catalogue of current scientific literature.

The following circular of the Society, together with the reply of Harvard University to the same, will doubtless be of interest to your readers, and by opening the columns of your journal to a discussion of the subject you will not fail to elicit valuable suggestions with regard to the details of the plan.

In adopting the recommendations of the committee as printed below, the University Council voted "that the Secretary of the Council be instructed to transmit to the Royal Society a letter stating the opinion of this Council, that the expression 'scientific literature' as used in the above recommendation ought to receive a very broad interpretation."

Yours very truly,

H. P. BOWDITCH.

LETTER FROM THE SECRETARIES OF THE ROYAL SOCIETY.

THE ROYAL SOCIETY,
Burlington House, March 22, 1894.

SIR: The Royal Society of London, as you are probably aware, has published nine quarto volumes of 'The Catalogue of Scientific Papers,' the first volume of the decade 1874-83 having been issued last year.

This Catalogue is limited to periodical scientific literature, *i. e.*, to papers published in the Transactions, etc., of Societies, and in Journals; it takes no account whatever of

monographs and independent books, however important. The titles; moreover, are arranged solely according to authors' names; and though the Society has long had under consideration the preparation of, and it is hoped may eventually issue, as a key to the volumes already published, a list in which the titles are arranged according to subject-matter, the Catalogue is still being prepared according to authors' names. Further, though the Society has endeavored to include the titles of all the scientific papers published in periodicals of acknowledged standing, the Catalogue is, even as regards periodical literature, confessedly incomplete, owing to the omission of the titles of papers published in periodicals of little importance, or not easy of access.

Owing to the great development of scientific literature, the task of the Society in continuing the Catalogue, even in its present form, is rapidly increasing in difficulty. At the same time it is clear that the progress of science would be greatly helped by, indeed, almost demands, the compilation of a Catalogue which should aim at completeness, and should contain the titles of scientific publications, whether appearing in periodicals or independently. In such a Catalogue the titles should be arranged not only according to authors' names, but also according to subject-matter, the text of each paper and not the title only being consulted for the latter purpose. And the value of the Catalogue would be greatly enhanced by a rapid periodical issue, and by publication in such a form that the portion which pertains to any particular branch of science might be obtained separately.

It is needless to say that the preparation and publication of such a complete Catalogue is far beyond the power and means of any single society.

Led by the above considerations, the President and Council of the Royal Society have appointed a committee to enquire into and

report upon the feasibility of such a Catalogue being compiled through international coöperation.

The committee are not as yet in a position to formulate any distinct plan by which such international coöperation might be brought about; but it may be useful even at the outset to make the following preliminary suggestions:—

The Catalogue should commence with papers published on or after January 1, 1900.

A central office or bureau should be established in some place to be hereafter chosen, and should be maintained by international contributions, either directly, that is by annual or other subsidies, or indirectly, that is by the guarantee to purchase a certain number of copies of the Catalogue.

This office should be regularly supplied with all the information necessary for the construction of the Catalogue. This might be done either by all periodicals, monographs, etc., being sent direct to the office to be catalogued there, or by various institutions undertaking to send in portions of the Catalogue already prepared, or by both methods combined.

At such an office arrangements might be made by which, in addition to preparing the Catalogue, scientific data might be tabulated as they came to hand in the papers supplied.

The first step, however, is to ascertain whether any scheme of international coöperation is feasible and desirable. The committee accordingly is desirous of learning the views upon this subject of scientific bodies and of scientific men.

We, therefore, venture to express the hope that you will be so good as, at some early opportunity, to bring the matter before the Harvard University and to make known to us, for the use of the committee, the conclusions arrived at concerning it.

Should the decision you report be in any way favorable to the scheme, may we fur-

ther ask you to communicate to us, for the use of the committee, any suggestions which you may think it desirable to make; as to the best methods of inaugurating a scheme; as to the constitution and means of maintenance of the Central Office; as to the exact character of the work to be carried on there; as to the language or languages in which the Catalogue should be published, and the like?

We are, your obedient servants,
(Signed) M. FOSTER, *Secretary R. S.*
RAYLEIGH, *Secretary R. S.*
J. LISTER, *Foreign Sec. R. S.*

REPORT OF THE COMMITTEE OF THE UNIVERSITY COUNCIL APPOINTED TO CONSIDER THE COMMUNICATION OF THE ROYAL SOCIETY RELATING TO A CATALOGUE OF SCIENTIFIC PAPERS TO BE MADE BY INTERNATIONAL COÖPERATION.

To the University Council of Harvard University:—

The committee of the University Council, to whom was referred the accompanying circular of the Royal Society, respectfully submits the following report:

The committee finds itself fully in sympathy with the desire of the Royal Society to improve the methods of cataloguing scientific literature, and is distinctly of the opinion that the establishment of such a catalogue, to be compiled through international coöperation, is both desirable and practicable.

To determine in what way this result can be best attained, it will be well to consider what are the defects of existing methods, and what are the requirements which an improved system may be reasonably expected to fill.

Bibliographical catalogues and indexes are generally defective in one or two ways. Either they present simply a list of titles which often convey an inadequate, and sometimes a misleading idea of the contents

of the articles catalogued, or they appear, like the various annual reports, so long after the publication of the articles which are reported upon that they lose a great part of their value as guides to current literature. A third defect is common to all existing catalogues, viz., that of necessitating a reference to a number of separate volumes whenever the literature of several years is to be sought for.

It is evident that some form of *card catalogue* can alone remedy these defects, so that the practical question is: How can a card catalogue of current scientific literature be best established and maintained? The requirements of such a catalogue may be stated as follows:—

1. It should appear promptly—if possible, simultaneously with the book or article catalogued.
2. It should furnish an accurate description of the purport of the book or article.
3. It should be readily accessible to all persons interested in the literature catalogued.

It seems probable that these requirements may best be met by the coöperation of a central bureau with the various publishers and editors of scientific literature in issuing with each book and with each number of every periodical a set of cards of standard size and type, each card to exhibit for a book, or for a single article in a periodical:—

1. The name of the author.
2. The title of the book or article.
3. The date, place, and house of publication of the book, or the title, volume, and page of the periodical in which the article appears.
4. A brief statement, not to exceed eight or ten lines, to be prepared by the author himself, setting forth the general purport of the book or article, so as to furnish the necessary data for cross references.

Each card should be in duplicate to permit of arrangement according to subject or